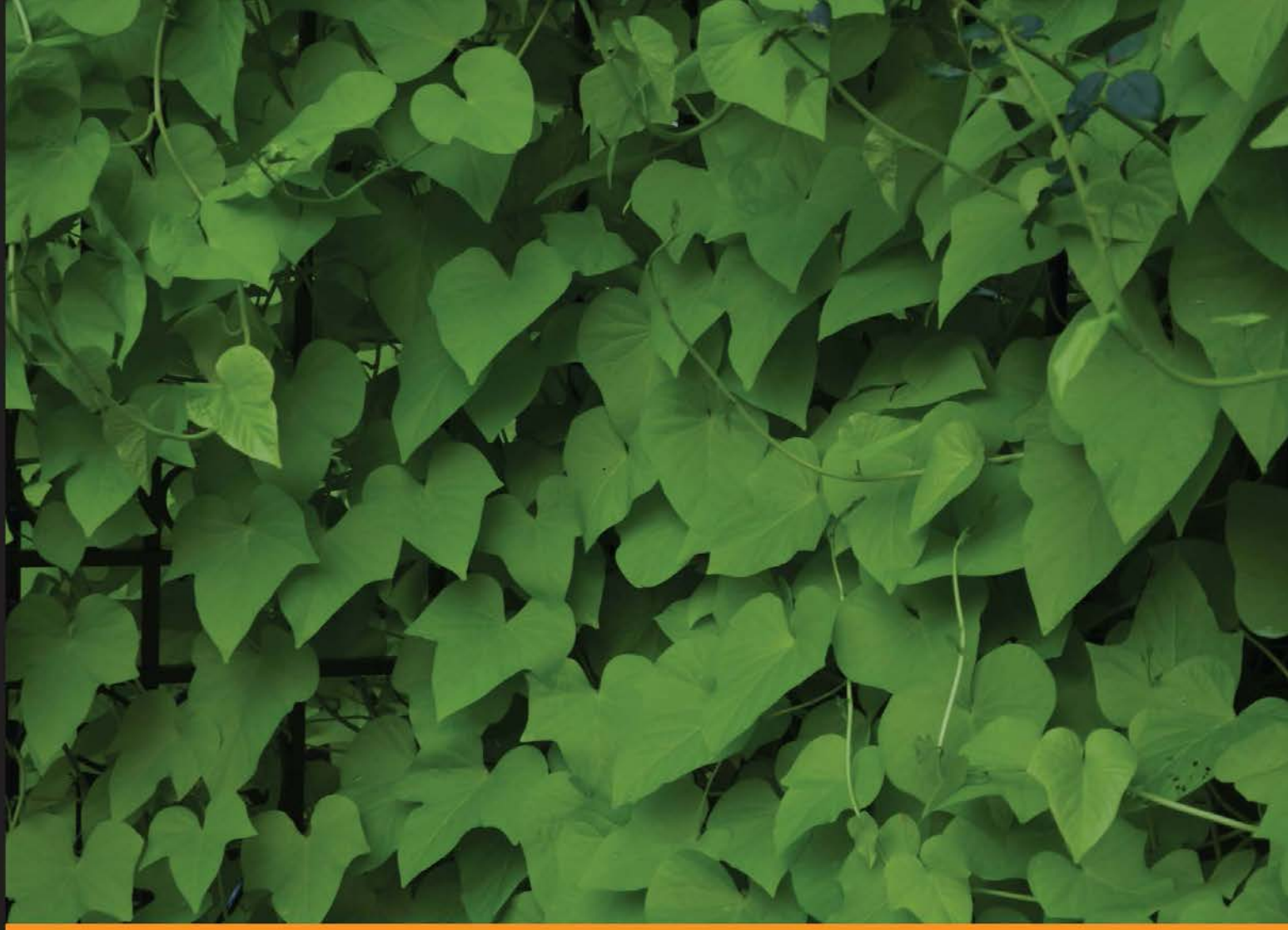

Community Experience Distilled

Backbone.js Testing

Plan, architect, and develop tests for Backbone.js applications using modern testing principles and practices

Ryan Roemer

[PACKT] PUBLISHING open source* community experience distilled

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BIRMINGHAM - MUMBAI

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First published: July 2013

Production Reference: 1050713

Published by Packt Publishing Ltd.
Livery Place
35 Livery Street
Birmingham B3 2PB, UK.

ISBN 978-1-78216-524-8

www.packtpub.com

Cover Image by Robin Chin Roemer (quiet.days@gmail.com)

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Ryan Roemer is the Director of Engineering at Curiosity Media, a language learning startup, where he manages technical operations and leads the development team. He develops (and tests) full-stack JavaScript applications and backend Node.js services. He also works with data mining, cloud architectures, and problems related to large scale distributed systems.

He was previously an engineer in the cloud computing storage group of Microsoft's Azure platform and most recently developed the search and cloud architecture for IP Street, a patent data mining startup. Besides engineering, he is a registered patent attorney (inactive), although it has been a long time since he has put on his lawyer hat.

You can find him online at `http://loose-bits.com` and on Twitter at `https://twitter.com/ryan_roemer`.

This book simply would not have been possible without the open source community, which has contributed to all the pieces of technology we have discussed in this book. In particular, the Backbone.js community's commitment to documentation, tutorials, and guides allows the rest of the Web to keep up with the amazingly rapid evolution of the Backbone.js library and ecosystem.

I would like to thank the JavaScript developer communities in the District of Columbia and Seattle, WA, for their incidental feedback, chats, and ideas throughout the development of the book. Additionally, I owe a debt of gratitude to the book's technical reviewers, as they put up with some quite rough early drafts of chapters, provided immensely useful feedback, and helped shepherd the book to its final form.

Finally, my most heartfelt thanks and love to my wife, Robin. Your support and help through the late nights, weekends, and a hectic cross-country move has been truly indispensible.

About the Reviewers

Casey Foster is a full-stack web developer born and raised in Southern California and now residing in Texas. He has been drawn towards web development since his early teens and has found a passion for JavaScript in the browser and on the server side with Node.js. He is a huge fan of open source projects and tries to open source as many of his projects as possible. He is a core contributor to the popular Backbone.js library and an active supporter of many other open source repositories. In early 2013, he co-authored his first book on Backbone.js, titled *Developing a Backbone.js Edge*. He can be found on GitHub and Twitter as `caseywebdev`.

I would like to thank my wife Lacey and my puppy Gunner for their love and support in everything I do.

Jim Newbery is a web developer based in Edinburgh, Scotland, with a 17-year history of mostly building terrible websites and web applications. Once excited by being able to make text blink on a screen, he now spends his time working for the fantasy sports website `FanDuel.com`, tinkering with the usual plethora of half-finished side projects, and teaching his daughter how to make animated gifs of kittens.

I'd like to thank all those developers that give up hours and hours of personal time to contribute to open source software projects that make my working life easier and more enjoyable. Thanks, in particular, go to Jeremy Ashkenas, TJ Holowaychuk, and Christian Johansen for creating the libraries and tools used in this book.

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Table of Contents

Preface

JavaScript web applications are soaring in popularity and driving exciting new application possibilities across the Internet. One of the most ubiquitous frameworks leading this charge is Backbone.js, which provides a modern and rational approach for organizing JavaScript applications.

At the same time, testing client-side JavaScript and Backbone.js applications remains a difficult and tedious undertaking. Even experienced developers can stumble across issues related to browser idiosyncrasies, complex DOM interactions, and asynchronous application behavior when writing frontend tests.

Backbone.js Testing brings sensible practices and current techniques to the challenges of Backbone.js test development. You will be introduced to fundamental testing concepts, a contemporary frontend test infrastructure, and practical exercises on all facets of Backbone.js application development. This book covers topics ranging from basic test suite creation to using test doubles to tackle even the most difficult/least testable Backbone.js application components.

With a little guidance from this book, you can test your Backbone.js web applications easily, quickly, and with confidence.

What this book covers

Chapter 1, *Setting Up a Test Infrastructure*, starts with the basics of how to set up your test application code and obtain the test libraries that we will use throughout this book. We create a basic test infrastructure, write the first tests, and review the test report results.

Chapter 2, *Creating a Backbone.js Application Test Plan*, begins with a refresher of Backbone.js fundamentals, introduces a sample web application for the book, and discusses a wide range of relevant testing and planning concepts. We conclude by writing and running our first Backbone.js application tests.

Chapter 3, *Test Assertions, Specs, and Suites*, covers the basics of writing Backbone.js test suites and specs with Mocha and test assertions with Chai.

Chapter 4, *Test Spies*, introduces the Sinon.JS test double library and how to spy on application method behaviors in Backbone.js tests.

Chapter 5, *Test Stubs and Mocks*, dives deeper into Sinon.JS, with stubs and mocks that can replace application method behaviors. We examine how stubs and mocks can reduce application dependencies in tests and facilitate easier and more tractable Backbone.js application tests.

Chapter 6, *Automated Web Testing*, enhances the test infrastructure built in the previous chapters to run automatically, for example, from the command line or a continuous integration server.

Who this book is for

This book is for JavaScript developers who are looking to create and implement test support for Backbone.js web applications. You should be comfortable with the JavaScript programming language and familiar with Backbone.js application development including the core components such as models, views, and routers, although you may be just learning the framework as you explore the testing topics of this book. Some exposure to testing methodology and technologies (in any language) would be helpful but not required.

Conventions

In this book, you will find a number of styles of text that distinguish between different kinds of information. Here are some examples of these styles, and an explanation of their meaning.

Code words in text, database table names, folder names, filenames, file extensions, pathnames, dummy URLs, user input, and Twitter handles are shown as follows: "We simulate slow tests using the native JavaScript function `setTimeout()`."

A block of code is set as follows:

```
describe("Test failures", function () {
  it("should fail on assertion", function () {
    expect("hi").to.equal("goodbye");
  });
});
```

When we wish to draw your attention to a particular part of a code block, the relevant lines or items are set in bold:

```
describe("Test failures", function () {
  it("should fail on assertion", function () {
    expect("hi").to.equal("goodbye");
  });
});
```

Any command line input or output is written as follows:

```
$ mocha-phantomjs chapters/05/test/test.html
```

New terms and **important words** are shown in bold. Words that you see on the screen, in menus or dialog boxes for example, appear in the text like this: "clicking the **Next** button moves you to the next screen".

Warnings or important notes appear in a box like this.

Tips and tricks appear like this.

Reader feedback

Feedback from our readers is always welcome. Let us know what you think about this book—what you liked or may have disliked. Reader feedback is important for us to develop titles that you really get the most out of.

To send us general feedback, simply send an e-mail to `feedback@packtpub.com`, and mention the book title via the subject of your message.

If there is a topic that you have expertise in and you are interested in either writing or contributing to a book, see our author guide on `www.packtpub.com/authors`.

Customer support

Now that you are the proud owner of a Packt book, we have a number of things to help you to get the most from your purchase.

Downloading the example code

The source code for all the examples and files in this book are available at the GitHub repository (`https://github.com/ryan-roemer/backbone-testing/`) and introduced in more detail at `http://backbone-testing.com`. The `http://backbone-testing.com` website will always contain the most current and updated instructions for obtaining and using the code examples for this book.

The code samples repository internally uses symbolic links for some libraries and files. Accordingly, Windows users may need to download the samples archive from Packt (see the ensuing instructions) instead of GitHub.

As this is an open source project, the examples may be periodically updated to fix bugs or to clarify code or concepts. Thus, the code snippets in the book may not exactly match the online code samples, but there should not be too much difference in practice. Ultimately, you can rely on the GitHub repository as the most correct version of the code in this book.

Due to limitations in the Chai assertion library, the minimum browser requirements for running the examples are as follows:

- **Chrome**: 7+
- **Safari**: 5+
- **Firefox**: 4+
- **Internet Explorer**: 9+

The vendor library versions that we use in this book include the following:

- **Backbone.js**: 1.0.0
- **Underscore.js**: 1.4.4
- **jQuery**: 2.0.2
- **Mocha**: 1.9.0
- **Chai**: 1.7.1
- **Sinon.JS**: 1.7.3

The GitHub repository will attempt to keep up with the changes as these libraries continue to evolve over time. At the same time, most of the application and testing samples in the book should continue to work well with the updated libraries for the foreseeable future, except where specifically noted otherwise in this book or on the website.

Files and code for each chapter are provided via a directory structure of `chapters/NUMBER`, where `NUMBER` is the chapter number. The example Backbone.js web application—Notes—is available in a `localStorage` version in the `notes` directory and as a full MongoDB-backed Node.js server in `notes-rest`.

To retrieve the example code, you can download the entire zipped archive from: `https://github.com/ryan-roemer/backbone-testing/archive/master.zip`. Another option is to use `git` to checkout the source code directly:

```
$ git clone https://github.com/ryan-roemer/backbone-testing.git
```

Finally, you can download the example code files for all Packt books you have purchased from your account at `http://www.packtpub.com`. If you have purchased this book elsewhere, you can visit `http://www.packtpub.com/support` and register to have the files e-mailed directly to you.

Errata

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